

WHAT WE CLAIM IS:

1. An anti-penetration, flexible ballistic composite material comprising a plurality of ballistic fibres arranged on overlying layers, wherein at least a portion of
5 said fibres is impregnated with a polymer in the form of a viscous or visco-elastic liquid.
2. The flexible composite material according to claim 1, wherein said polymer is a non-Newtonian visco-elastic liquid.
- 10 3. The ballistic composite material according to claim 1, wherein said polymer is in form of a visco-elastic liquid, wherein the dissipative component is greater with respect to the elastic component $G'' > G'$.
4. The ballistic composite material according to claim
15 1, wherein said polymer has a dynamic viscosity ranging from 250 to 25,000,000 mPa·s at 25°C.
5. The ballistic composite material according to claim 1, wherein said polymer has a molecular weight ranging from 250 to 50,000.
- 20 6. The ballistic material according to claim 1, wherein said polymer has a kinematics viscosity higher than 200 cST at 25°C.
7. The ballistic composite material according to claim 1, wherein said polymer is selected from the group con-
25 sisting of polyolefins, polyvinyl alcohol derivatives,

polyisoprenes, polybutadienes, polybutenes, polyisobutylenes, polyesters, polyacrylates, polyamides, polysulfones, polysulfides; polyurethanes, polycarbonates, fluoro-carbons, silicones, glycols, liquid block copolymers, polyacrylic, epoxy, phenolic, liquid rubbers and their mixtures.

8. The ballistic composite material according to claim 1, wherein said polymer is in liquid form at a temperature lower than -128°C .

10 9. The ballistic composite material according to claim 1, wherein said polymer is a liquid with a thixotropic behaviour.

10. The ballistic composite material according to claim 1, wherein the fibres are arranged in a form selected from weft-warp fabric, unidirectional structure, semi-unidirectional structure, multi-directional structure, semi-multidirectional structure, bi- or multi-axial structure or combinations thereof.

11. The ballistic composite material according to claim 1, wherein said ballistic fibres are selected from the group consisting of polyvinyl alcohol, polyacrylonitrile, polyethylene, polybenzobisoxazole (PBO), polyimidic, polyaramidic, polyamidic, heterocyclic aramide, carbon or glass fibres and mixtures thereof.

25 12. The ballistic composite material according to claim

1, wherein the strength of said ballistic fibres is at least 15 g/den.

13. The ballistic composite material according to claim 1, wherein the modulus of said ballistic fibres is at least 200 g/den.

14. The ballistic composite material according to claim 1, wherein the energy to break of said ballistic fibres is at least 10 joules/g.

15. The ballistic composite material according to claims 1, wherein the count of said ballistic fibres ranges from 50 to 3,000 dtex and/or the count of each fibril ranges from 0.5 to 20 dtex.

16. The ballistic composite material according to claim 1, wherein a portion of said ballistic fibres is in contact with a thermoplastic, thermosetting, elastomeric, cross-linkable polymer and their mixtures.

17. The ballistic composite material according to claim 1, wherein at least a portion of said ballistic fibres is impregnated with said polymer in the form of a viscous or visco-elastic liquid.

18. The ballistic composite material according to claim 1, further comprising a polymeric film between or outside one or more of the layers of ballistic fibres.

19. The ballistic composite material according to claim 18, wherein said polymeric film comprises a polymer or a

resin, each of which can be independently thermoplastic or thermosetting, crosslinkable, elastomeric and mixtures thereof.

20. The ballistic composite material according to any of
5 the claim 1, wherein at least two layers of fibres are bound to each other by means of connecting means.

21. The ballistic material according to claim 20, wherein said connecting means comprise yarns or monofilaments.

10 22. The ballistic material according to claim 1, wherein the polymer in liquid form is polybutene.

23. Body armour comprising a ballistic composite material according to claim 1.

24. The body armour according to claim 23, consisting of
15 a bullet-proof vest.

25. A process for preparing an anti-penetration flexible ballistic composite material which comprises the application of a polymer in the form of a viscous or viscoelastic liquid on at least a portion of said ballistic
20 fibre.

26. The process according to claim 25, comprising the weaving of ballistic fibres, the impregnation of the fabric produced with a viscous or visco-elastic liquid polymer and the calendaring of the impregnated fabric.

25 27. The process according to claim 25, wherein the yarn

is impregnated with a liquid polymer before the weaving and calendaring phase.